We claim:

1. A method of selectively removing neoplastic cells from a mixed cellular composition wherein said composition is located outside of a living organism, said method comprising the steps of:
   (a) contacting the mixed cellular composition with a virus under conditions which result in substantial killing of neoplastic cells so as to selectively remove neoplastic cells from the composition; and
   (b) collecting the treated cellular composition.

2. The method of Claim 1 wherein the mixed cellular composition comprises hematopoietic stem cells.

3. The method of Claim 2 wherein the hematopoietic stem cells have been harvested from bone marrow.

4. The method of Claim 2 wherein the hematopoietic stem cells have been harvested from blood.

5. The method of Claim 1 wherein the cellular composition comprises a tissue, an organ or any portion of a tissue or an organ.

6. The method of Claim 5 wherein the tissue or organ is selected from the group consisting of liver, kidney, heart, cornea, skin, lung, pancreatic islet cells, and whole blood.

7. The method of Claim 5 wherein the tissue, organ or portion of the tissue or organ is useful for transplantation.

8. The method of Claim 1 wherein the cellular composition comprises cultured cells, semen or eggs.

9. The method of Claim 1 wherein the virus is a replication competent virus.

10. The method of Claim 1 wherein the virus is not a reovirus.

11. The method of Claim 1 wherein the virus is selected from the group consisting of adenovirus, herpes simplex virus, vaccinia virus and parapoxvirus orf.

12. The method of Claim 11 wherein the virus is mutated or modified such that the virus does not produce a gene product which inhibits double stranded RNA kinase (PKR).

13. The method of Claim 11 wherein the adenovirus has been mutated in E1A region such that the resulting E1A gene product does not bind to Rb.

14. The method of Claim 11 wherein the adenovirus has been mutated in E1B region such that the resulting E1B gene product does not bind to p53.

15. The method of Claim 11 wherein the adenovirus is capable of expressing a wild type p53 protein.

16. The method of Claim 1 further comprising adding interferon to the mixed cellular composition.

17. The method of Claim 16 wherein the interferon is added prior to or simultaneously with the virus.

18. The method of Claim 16 wherein the virus is an interferon sensitive virus.

19. The method of Claim 18 wherein the virus is vesicular stomatitis virus (VSV).

20. The method of Claim 1 wherein the virus is not Newcastle Disease virus (NDV).

21. The method of Claim 1 further comprising the step of removing the virus from the virus treated cellular composition.

22. The method of Claim 1 further comprising the step of storing the virus treated cellular composition.

23. The method of Claim 22 wherein the cellular composition is stored in a solution containing DMSO.

24. A composition of viable non-neoplastic cells comprising the virus treated cellular composition of Claim 1.

25. A kit comprising at least two viruses selected from the group consisting of reovirus, a virus expressing a functional p53 protein, Delta24, ONYX-015, Newcastle disease virus and vesicular stomatitis virus.